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(54) **TRANSMITTING DEVICES AND TRANSMISSION METHODS**

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(51) **Int. Cl.**

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G06F 3/044	(2006.01)
H04W 4/00	(2009.01)
H04M 1/725	(2006.01)
H04B 1/00	(2006.01)

(52) **U.S. Cl.**
CPC ***G06F 3/044*** (2013.01); ***H04M 1/7253*** (2013.01); ***H04W 4/008*** (2013.01); *H04M 2250/22* (2013.01)

(58) **Field of Classification Search**
CPC G06F 3/044; G06F 3/0488; G06K 19/0723
USPC 345/173, 174; 455/41.1
See application file for complete search history.

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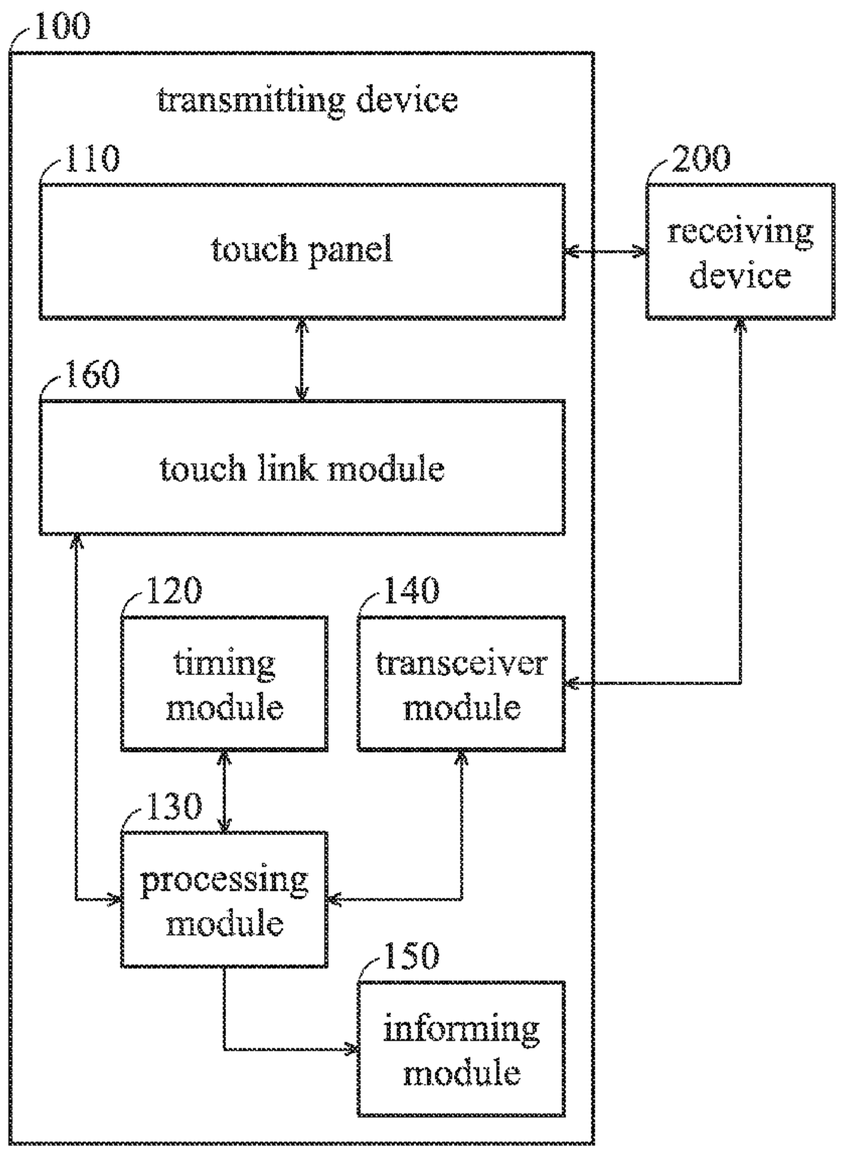
(57) **ABSTRACT**

Transmitting devices and transmission methods are provided. The transmitting device includes a touch panel, a touch link module, a processing module and a transceiver module. The touch link module establishes a touch link with a receiving device through the touch panel. The processing module determines an instruction according to the link duration of the transmitting device and the receiving device after the touch link has been established. The transceiver module transmits the instruction to the receiving device.

26 Claims, 9 Drawing Sheets



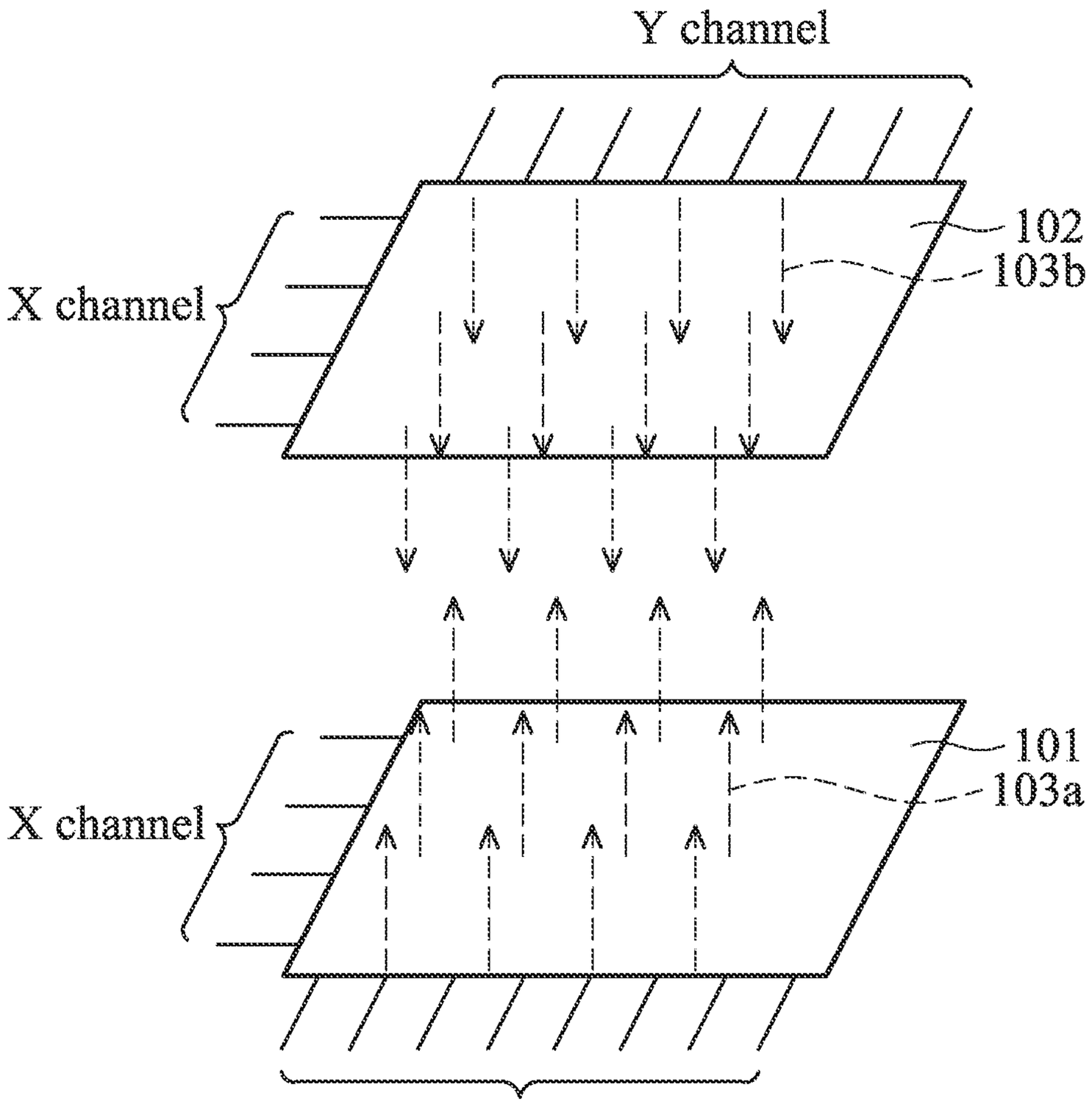


FIG. 1 (PRIOR ART)

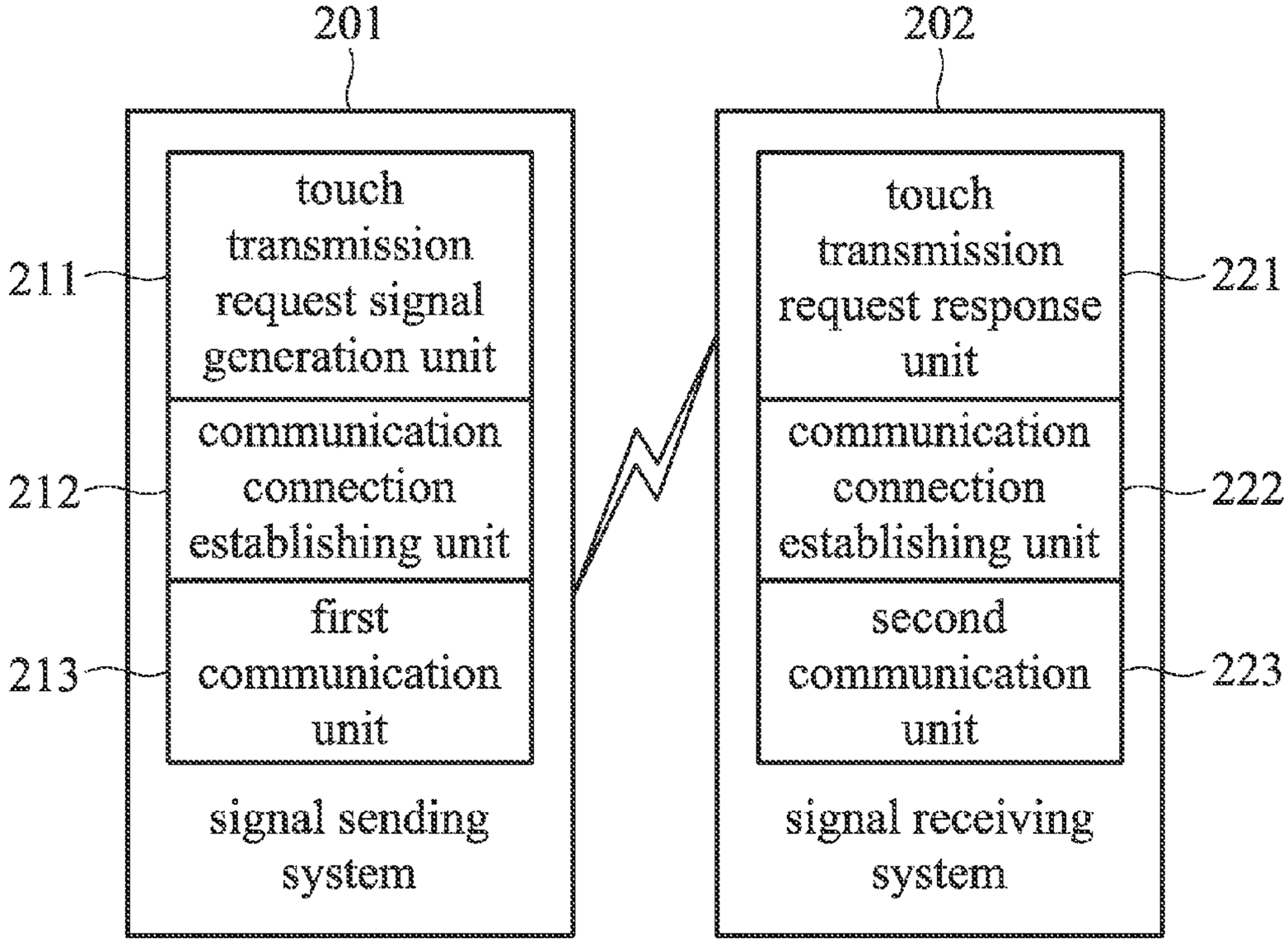


FIG. 2 (PRIOR ART)

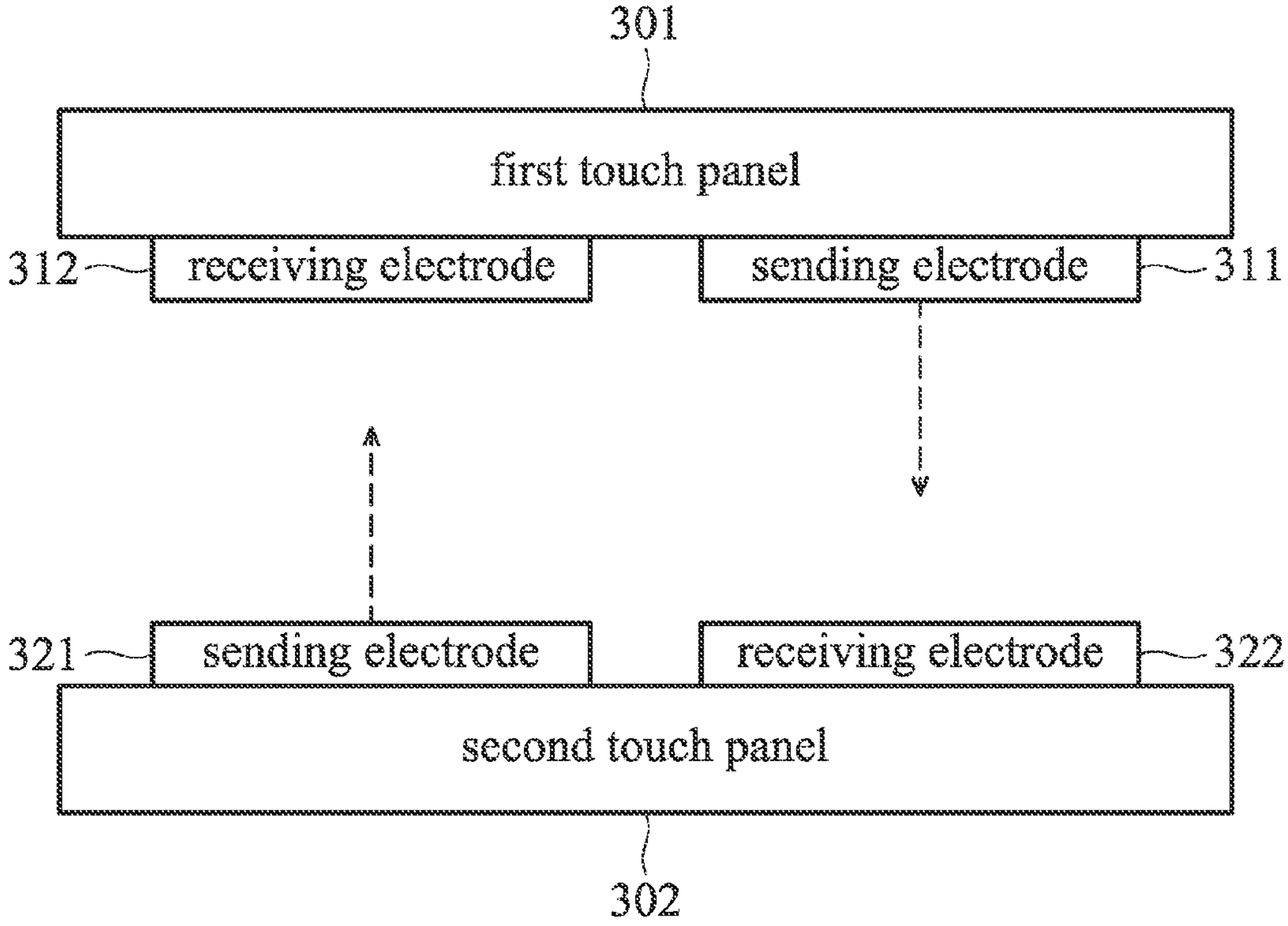


FIG. 3 (PRIOR ART)

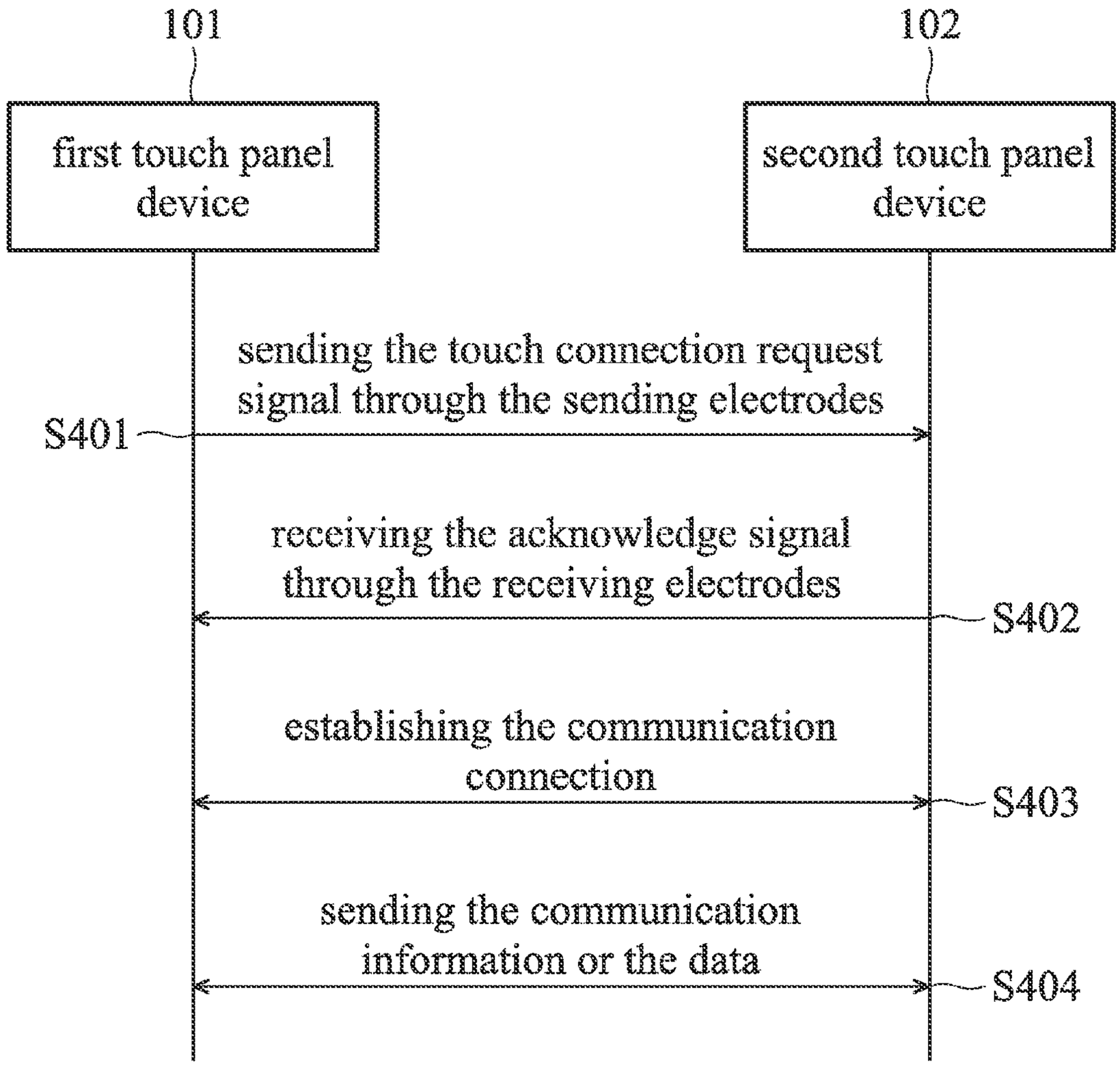


FIG. 4 (PRIOR ART)

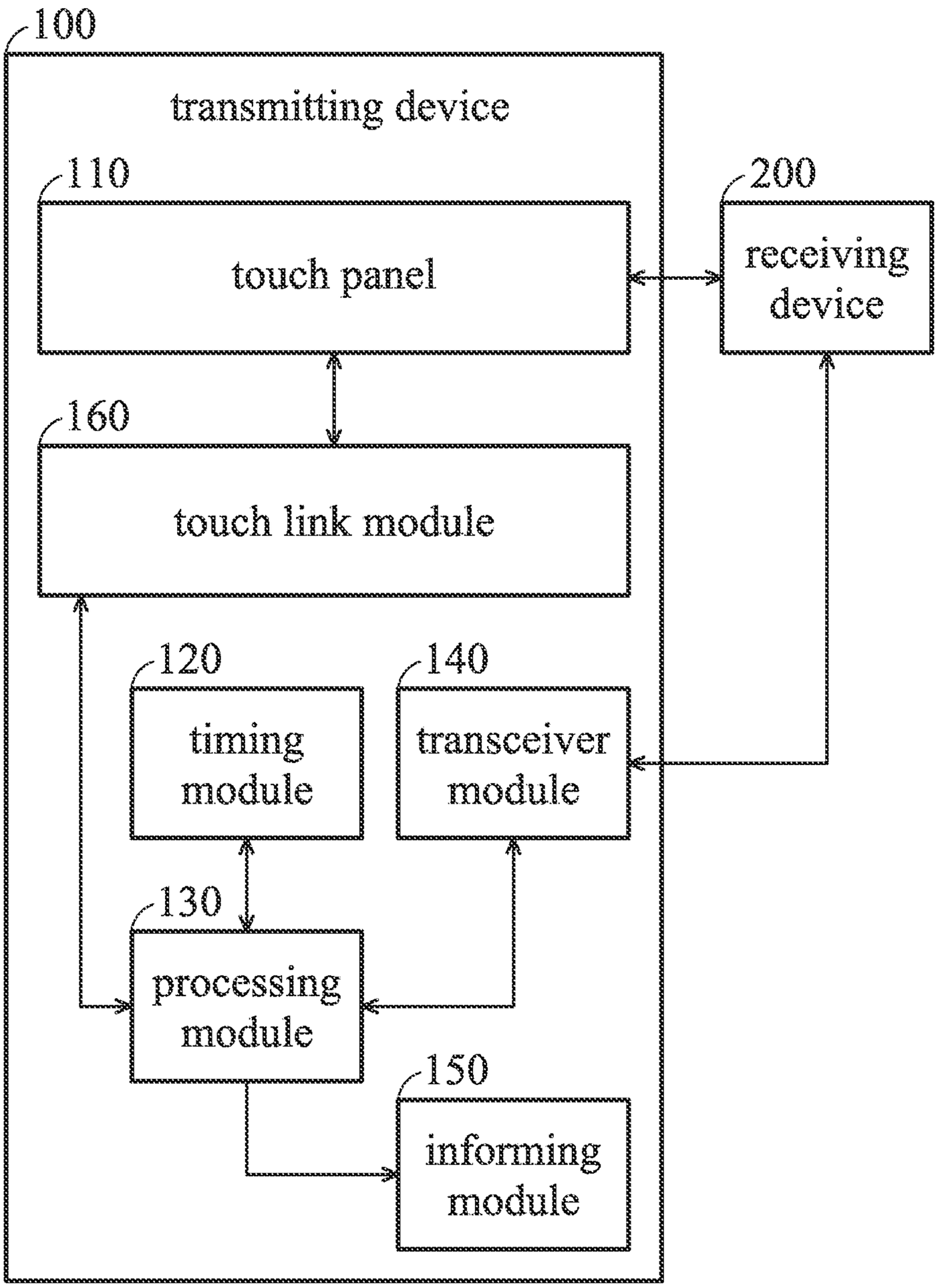

100
transmitting device
110
touch panel
200
receiving device
160
touch link module
120
timing module
140
transceiver module
130
processing module
150
informing module

FIG. 5

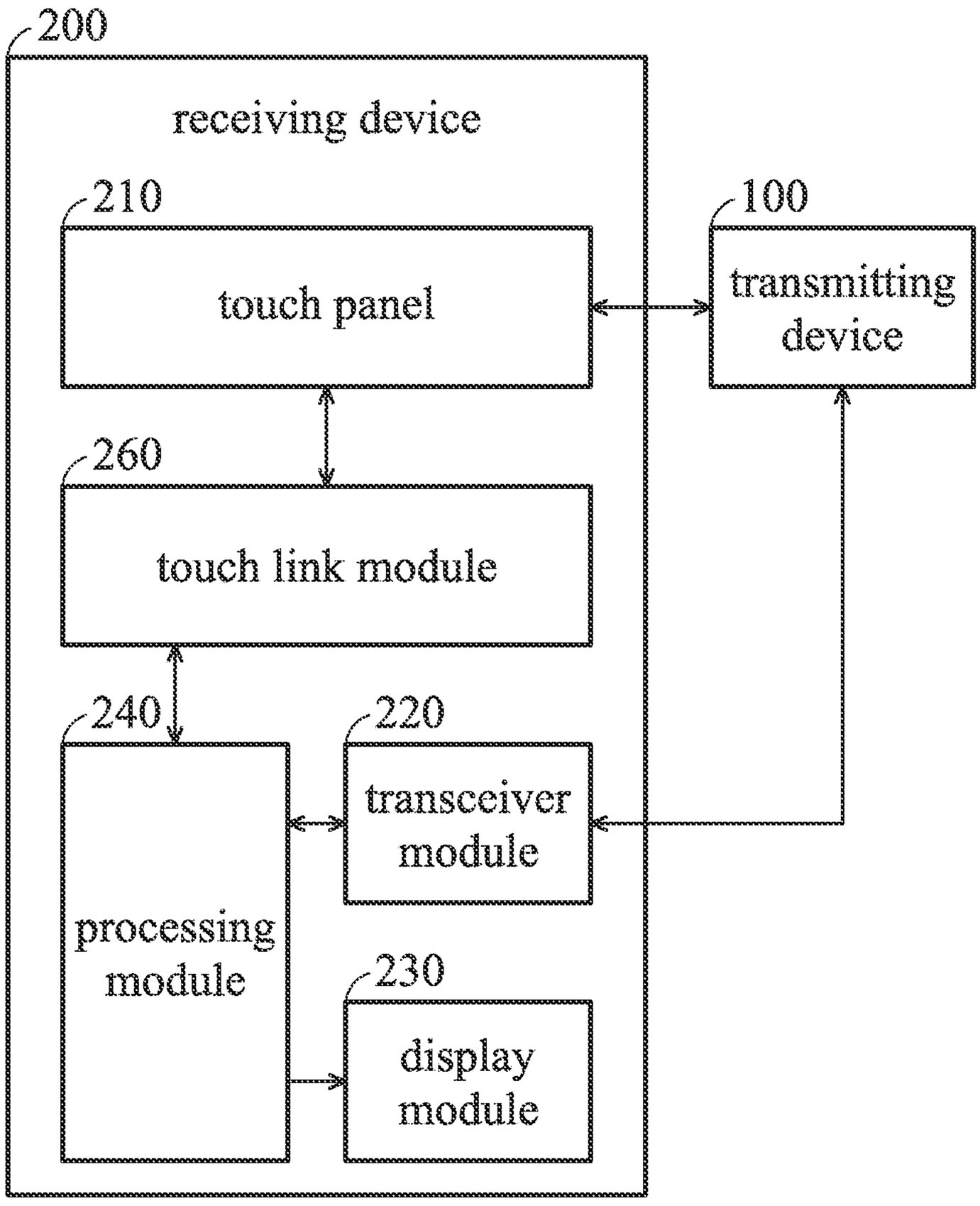

200
receiving device
210
touch panel
100
transmitting device
260
touch link module
240
processing module
220
transceiver module
230
display module

FIG. 6

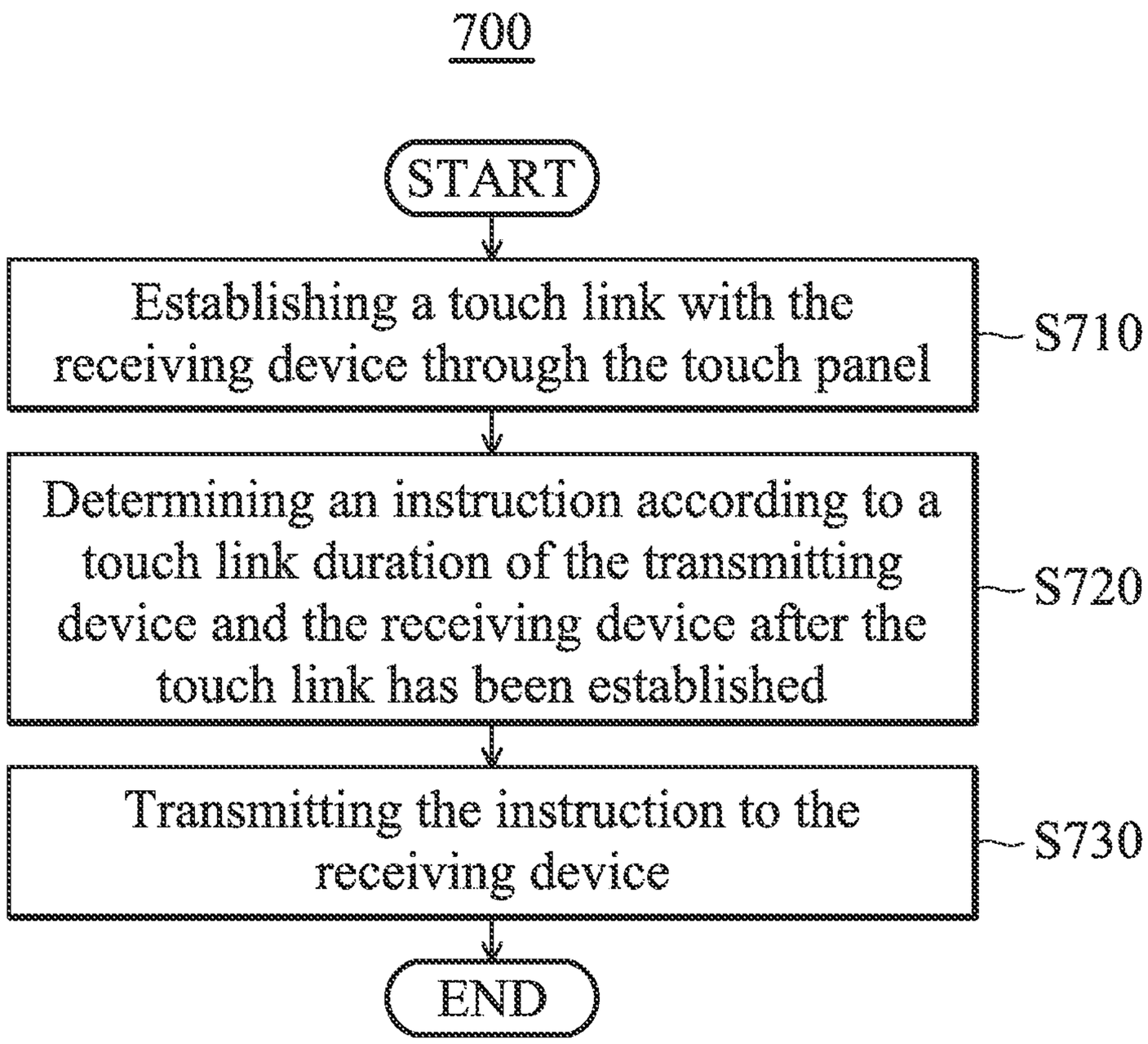

700
START
Establishing a touch link with the receiving device through the touch panel
S710
Determining an instruction according to a touch link duration of the transmitting device and the receiving device after the touch link has been established
S720
Transmitting the instruction to the receiving device
S730
END

FIG. 7

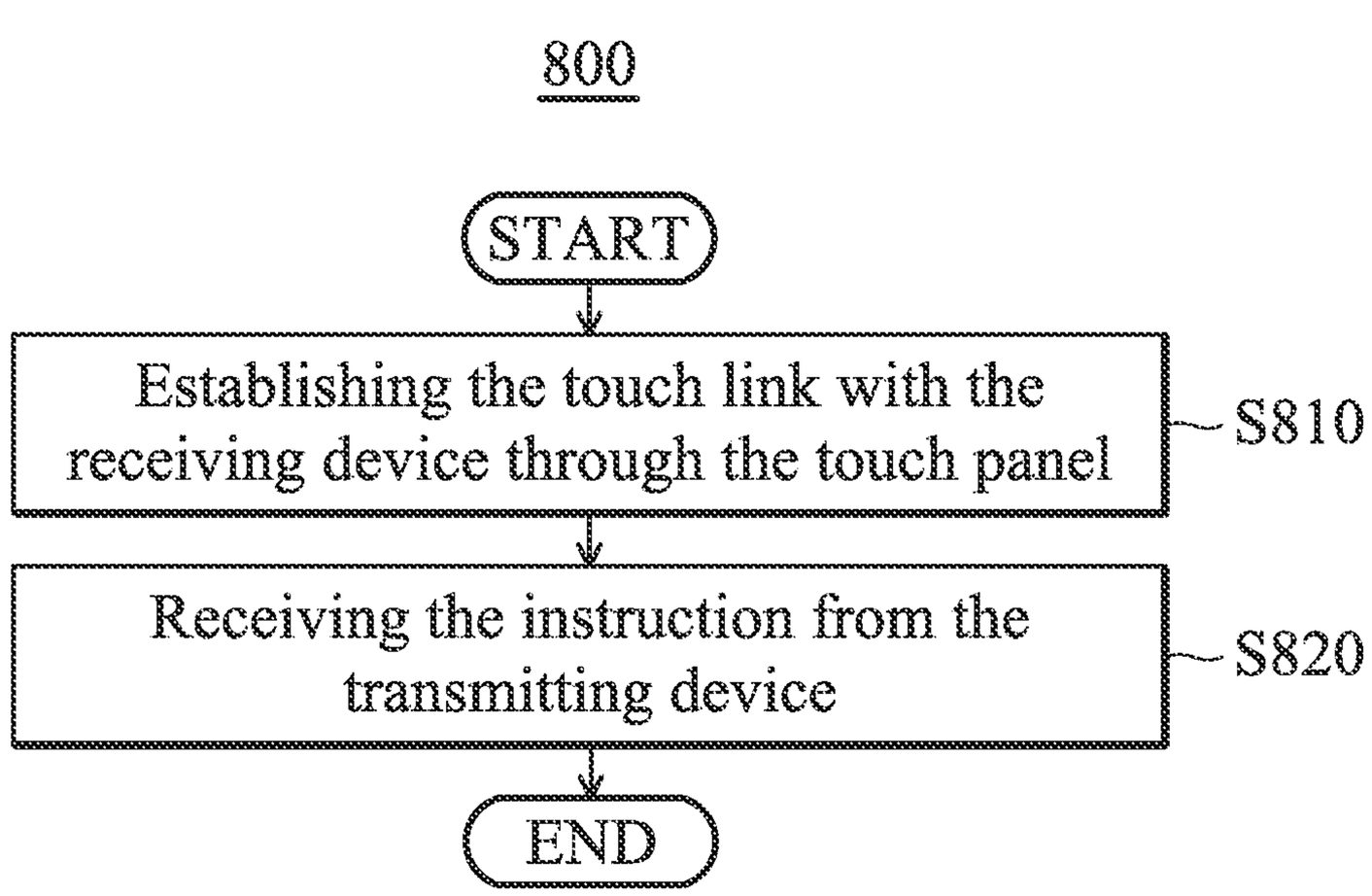

800
START
Establishing the touch link with the receiving device through the touch panel
S810
Receiving the instruction from the transmitting device
S820
END

FIG. 8

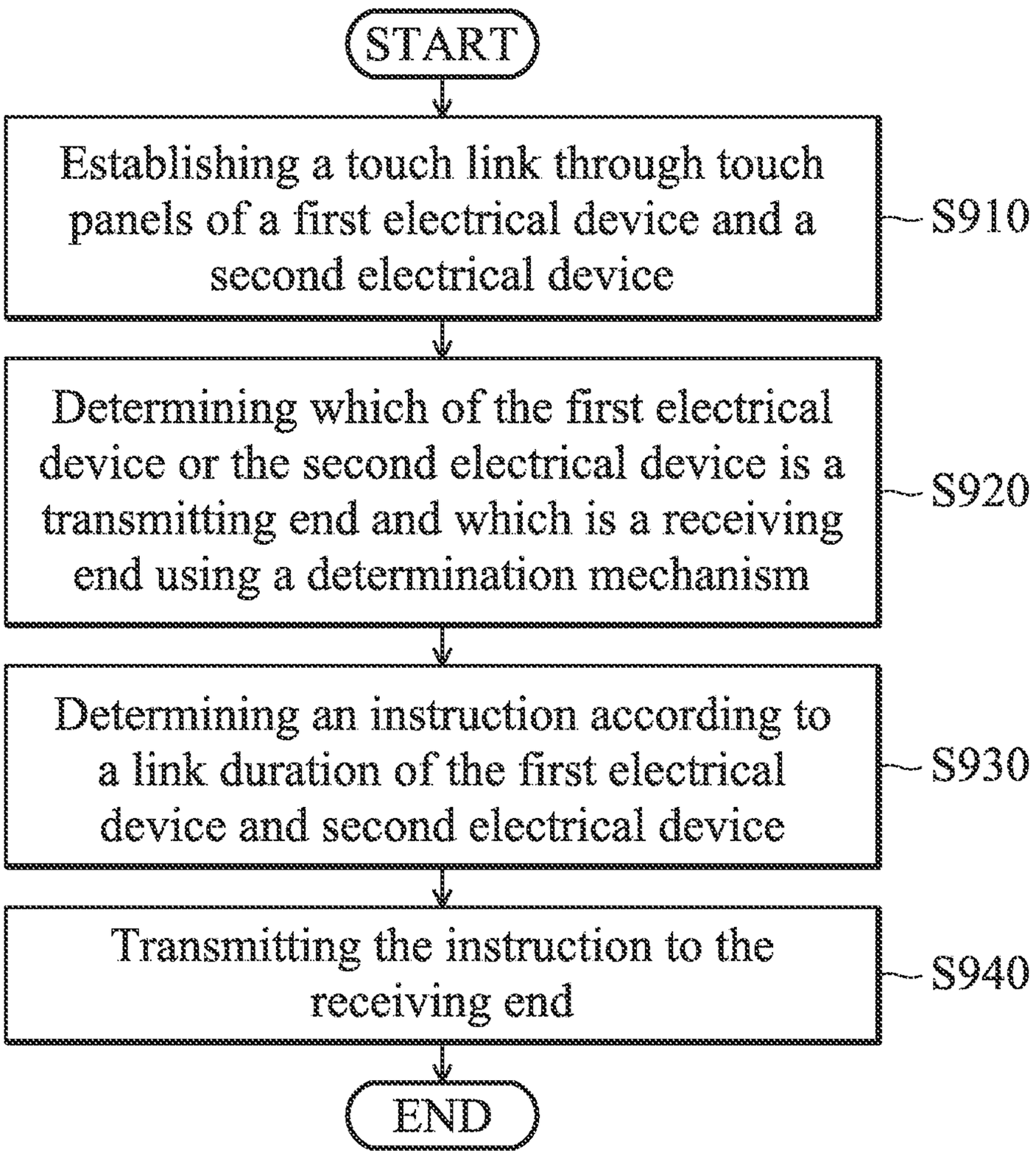

900
START
Establishing a touch link through touch panels of a first electrical device and a second electrical device
S910
Determining which of the first electrical device or the second electrical device is a transmitting end and which is a receiving end using a determination mechanism
S920
Determining an instruction according to a link duration of the first electrical device and second electrical device
S930
Transmitting the instruction to the receiving end
S940
END

FIG. 9

TRANSMITTING DEVICES AND TRANSMISSION METHODS

CROSS REFERENCE TO RELATED APPLICATIONS

This Application claims priority of China Patent Application No. 201410160768.5, filed on Apr. 21, 2014, the entirety of which is incorporated by reference herein.

BACKGROUND OF THE INVENTION

Field of the Invention

The invention generally relates to data transmission, and more particularly, to data transmission through touch link technology.

Description of the Related Art

Near Field Communication (NFC) is a contactless technology for identification and interconnection. Near Field Communication allows users to exchange the information, access contacts and services by using the near field magnetic communication (such as the near field magnetic communication of 13.56 MHz) between the mobile devices, consumer electronics, PCs, or smart electronic devices.

Due to the maturity of the market, a mobile phone with NFC can either support a mobile payment function or serve as a point of sale (POS) device. However, a proximity card reader or a like element must be added to the handheld device due to the NFC being operated by sending and receiving a signal, and that will make the size of the handheld device larger, and the layout and the elements of the handheld device might be limited.

A touch-and-connect (touch link or touch connection) technology for touch panel devices which use an existing panel and driver IC for communication was developed recently, and has been described in US 2011/0304583, US 2013/0147760, CN 102916729A. The touch panel device includes a touch sensor. At least part of the touch sensor includes at least part of the touch panel of the touch panel device. The touch panel can be a touch panel without a display function, such as a touch pad, or with a display function, such as a touch screen. The touch sensor includes driving electrodes and sensing electrodes set on the substrate of the touch panel for forming the capacitance structure. At least one of the driving electrodes and the sensing electrodes is used as a sending electrode, and at least one is used as a receiving electrode. Thus, the signal can be sent and received by the existing electrodes and driver IC of the touch panel device, thereby achieving touch transmission based on an electric field without additional proximity card readers or like elements, reducing the size and cost of the touch panel device.

FIG. **1** is a schematic diagram of the touch transmission between a first touch panel device and a second touch panel device in accordance with the related art. As shown in FIG. **1**, there are near fields **103***a* and **103***b* between the first touch panel device **101** and the second touch panel device **102**. It should be noted that the first touch panel device **101** and the second touch panel device **102** are enabled to send and receive the signal. The first touch panel device **101** sends the signal to the second touch panel device **102** through a communication medium which is an electric field pointed to the second touch panel device **102** (the near field **103***a* as shown in FIG. **1**). The second touch panel device **102** sends the signal to the first touch panel device **101** through a communication medium which is an electric field pointed to the first touch panel device **101** (the near field **103***b* as shown in FIG. **1**). The X channel and the Y channel shown in FIG. **1** are used as the sending electrodes and the receiving electrodes set on the substrate for forming the capacitance structure.

FIG. **2** is a logic chart for achieving the touch transmission system between the first touch panel device and the second touch panel device in accordance with the related art. The first touch panel device includes a signal sending system **201**, and the second touch panel device includes a signal receiving system **202**, also shown in FIG. **2**. The signal sending system **201** includes a touch transmission request signal generation unit **211**, a communication connection establishing unit **212** and a first communication unit **213**. The touch transmission request signal generation unit **211** is used to generate a request signal for touch transmission to the second touch panel device **102** through the sending electrode. The communication connection establishing unit **212** establishes a communication connection with the second touch panel device **102** after the receiving electrodes receive a response signal from the second touch panel device **102**. The first communication unit **213** sends the communication information or the data to the second touch panel device **102** through the sending electrodes after the communication connection is established.

The signal receiving system **202** includes a touch transmission request response unit **221**, a communication connection establishing unit **222** and a second communication unit **223**. The touch transmission request response unit **221** responds with an acknowledge signal to the first touch panel device **101** through the sending electrodes after the receiving electrodes receive a touch transmission request signal sent from the first touch panel device **101**. The communication connection establishing unit **222** establishes the communication connection with the first touch panel device **101** after the touch transmission request response unit **221** responds with the acknowledge signal to the first touch panel device **101**. The second communication unit **223** receives the communication information or the data sent from the first touch panel device **101** through the receiving electrodes after the communication connection is established.

FIG. **3** is a schematic illustrating the transmission and reception of the signal by the electrodes of the touch panel of the related art. As shown in FIG. **3**, the touch sensor (not shown) includes the sending electrodes **311**, **321** and the receiving electrodes **312**, **322** disposed on the substrate of the touch panel (such as the first touch panel **301** or the second touch panel **302**) for forming the capacitance structure. The sending electrodes **311**, **321** are used to send the signal, and the receiving electrodes **312**, **322** are used to receive the signal.

FIG. **4** is a flow chart of the touch connection method in accordance with the related art. First, in step S**401**, the touch transmission request signal generation unit **211** generates a touch connection request signal, and sends it to the second touch panel device **102** through the sending electrodes. Then the receiving electrodes receive the acknowledge signal from the second touch panel device **102** (step S**402**). After that, the communication connection establishing unit **212** establishes the communication connection with the second touch panel device **102** (step S**403**). Finally, the method goes to step S**404**, and the first communication unit **213** sends the communication information or the data to the second touch panel device **102** through the sending electrodes.

Traditionally, the transmitting device may transmit different instructions to the receiving device according to the user's operation. Therefore, how to improve the user expe-

rience with a more convenient and efficient method to transmit different instructions is worthy of discussion.

BRIEF SUMMARY OF THE INVENTION

A transmitting device, a transmission system, and transmission methods are provided to overcome the problems mentioned above.

In accordance with an aspect of the present invention, a transmitting device is provided. The transmitting device comprises a touch panel, a touch link module, a processing module and a transceiver module. The touch link module is to establish a touch link with a receiving device through the touch panel. The processing module is to determine an instruction according to a link duration of the transmitting device and the receiving device after the touch link has been established. The transceiver module is to transmit the instruction to the receiving device. In particular, the transmitting device comprises a timing module to count the link duration and transmit a counting result to the processing module after the touch link being established. In one aspect, the processing module transmits a request for the instruction to the receiving device through the transceiver module before transmitting the instruction to the receiving device, and the transmitting device determines whether to transmit the instruction to the receiving device according to a confirmed result of the receiving device.

In accordance with another aspect of the present invention, a transmission method is provided. The transmission method is applied to a transmitting device. The transmission method comprises the steps of establishing a touch link with a receiving device through a touch panel of the transmitting device; determining an instruction according to a link duration of the transmitting device and the receiving device after the touch link being established; and transmitting the instruction to the receiving device. In particular, the method further comprises the steps of counting the link duration and transmitting a counting result to the processing module after the touch link being established; and stopping counting the link duration when receiving a feedback signal.

In accordance with another aspect of the present invention, a transmission method is provided. The transmission method comprises the steps of establishing a touch link through touch panels of a first electrical device and a second electrical device; determining which of the first electrical device or second electrical device is a transmitting end and which is a receiving end using a determination mechanism after the touch link being established; determining an instruction according to a link duration of the touch link between the first electrical device and the second electrical device; and transmitting the instruction to the receiving end. In particular, the determination mechanism comprises a button setting, a sensing result, or an audio indication.

According to the transmission methods of the embodiments described above, convenience and the operational efficiency are improved when the user uses the touch link technology to transmit different instructions.

Other aspects and features of the invention will become apparent to those with ordinary skill in the art upon review of the following descriptions of specific embodiments of communication transmission methods and systems.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will become more fully understood by referring to the following detailed description with reference to the accompanying drawings, wherein:

FIG. **1** is a schematic diagram of the touch transmission between a first touch panel device and a second touch panel device in accordance with the related art;

FIG. **2** is a logic chart for achieving the touch transmission system between the first touch panel device and the second touch panel device in accordance with the related art;

FIG. **3** is a schematic illustrating the transmission and reception of the signal by the electrodes of the touch panel of the related art;

FIG. **4** is a flow chart of the touch connection method in accordance with the related art;

FIG. **5** is a block diagram of a transmitting device **100** according to an embodiment of the invention;

FIG. **6** is a block diagram of a receiving device **200** according to an embodiment of the invention;

FIG. **7** is a flow chart **700** illustrating the transmission method according to an embodiment of the invention;

FIG. **8** is a flow chart **800** illustrating the transmission method according to another embodiment of the invention;

FIG. **9** is a flow chart **900** illustrating the transmission method according to another embodiment of the invention.

DETAILED DESCRIPTION OF THE INVENTION

Certain terms and figures are used throughout the description and following claims to refer to particular components. As one skilled in the art will appreciate, manufacturers may refer to a component by different names. This document does not intend to distinguish between components that differ in name but not function. In the following description and in the claims, the terms "include" and "comprise" are used in an open-ended fashion, and thus should be interpreted to mean "include, but not limited to . . . ". Also, the term "couple" is intended to mean either an indirect or direct electrical connection. Therefore, a first electrical device is coupled with a second electrical device means the first electrical device is electrically connected to the second electrical device directly, or electrically connected to the second electrical device through other devices or mediums indirectly.

FIG. **5** is a block diagram of a transmitting device **100** according to an embodiment of the invention. The transmitting device **100** and receiving device **200** may be touch electronic device. The touch electronic device can be a mobile device such as a cell phone, a tablet PC, a note book, and a personal digital assistance (PDA), a desktop computer, a server or other electronic devices with touch modules (e.g. a touch IC). As shown in FIG. **5**, in an embodiment of the invention, the transmitting device **100** comprises a touch panel **110**, a timing module **120**, a processing module **130**, a transceiver module **140**, an informing module **150** and a touch link module **160**. Note that, in order to clarify the concept of the invention, FIG. **5** presents a simplified block diagram. However, the invention should not be limited to what is shown in FIG. **5**. The transmitting device **100** can further comprise other modules or elements. The receiving device **200** may comprise a touch panel **210** and a touch-link module **260**.

In an embodiment of the invention, the touch link module **160** comprises a sensing module **170** and a touch link module **180** (not shown in figures). Similarly, the touch link module **260** comprises a sensing module **270** and a touch link module **280** (not shown in figures). The structure and function of the sensing module **170** are similar to the sensing module **270** and the structure and function of the touch link module **180** are similar to the touch link module **280**. The

transmitting device **100** and/or the receiving device **200** detect whether it is in physical proximity to a device (e.g. approach or touch the device) by the sensing module **170** and/or the sensing module **270**. For example, when the distance between the transmitting device **100** and the receiving device **200** is less than 5 mm, the sensing module **170** will determine the transmitting device **100** and the receiving device **200** are in physical proximity of each other. That is to say the sensing module **170** can detect whether the transmitting device **100** is in physical proximity to a device. When the sensing module **170** detects the transmitting device **100** is in physical proximity to a device, a first communication channel will be established by the touch link module **180**. In an embodiment of the invention, the sensing module **170** detects the interacting electromagnetic field between the transmitting device **100** and the receiving device **200** (e.g. as shown in FIG. **3**, detecting, by the sending electrodes and receiving electrodes of the touch panel, whether the interacting electromagnetic field is generated) and determines whether the transmitting device **100** is in physical proximity to the receiving device **200** according to the variations in the electromagnetic field. When the sensing module **170** detects that the transmitting device **100** is in physical proximity to the receiving device **200**, the first communication channel will be established by the touch link module **180** and the touch link module **280**. In an embodiment of the invention, the first communication unit **213** can establish the first communication channel with the second communication unit **223** through the touch link module **160** of the transmitting device **100** and the touch link module **260** of the receiving device **200**.

In an embodiment of the invention, the timing module **120** comprises a timer which is configured to count the link duration of the touch link after the transmitting device **100** and the receiving device **200** established the touch link (i.e. established the first communication channel by the touch link technology). In an embodiment of the invention, the link duration of the touch link means the time duration of the touch link established by the transmitting device **100** and the receiving device **200**. In another embodiment of the invention, the link duration of the touch link means the time duration when the transmitting device **100** is in physical proximity to the receiving device **200**, wherein physical proximity means "approach" or "close to", for example, the distance between the transmitting device **100** and the receiving device **200** is about 5 mm. The processing module **130** is configured to determine the instructions according to the link duration of the touch link. Different link durations correspond to different instructions or instruction sets. For example, if the link duration is 1 second (a first link duration), the link duration corresponds to a transmission instruction; if the link duration is 3 seconds (a second link duration), the link duration corresponds to a display instruction; and if the link duration is 5 seconds (a third link duration), the link duration corresponds to the transmission instruction plus the display instruction. Note that, the example is only for clarifying the concept of the invention, but the invention should not be limited thereto. The user also can set and adjust the settings of the link durations and set different link durations to correspond to different instructions or instruction sets for different requirements.

In an embodiment of the invention, after the transmitting device **100** and receiving device **200** establish the touch link through the touch panel **110** according to the touch link technology, the processing module **130** indicates the first link duration corresponding to the first instruction to the timing module **120**, and then the timing module **120** starts to count the link duration. When the first link duration has expired, the timing module **120** will transmit a message to the processing module **130** to inform the processing module **130** that the first link duration has expired. After receiving the message, the processing module **130** will indicate the second link duration corresponding to the second instruction to the timing module **120** and then the timing module **120** starts to count the second link duration from the end of the first link duration accordingly. In an embodiment of the invention, when a user decides to trigger some instruction, the user may pick up or move the transmitting device **100**/receiving device **200**, knock at the transmitting device **100**, press a specific button on the transmitting device **100**, control the transmitting device **100** by voice control, or carry on other actions to generate a feedback signal to the transmitting device **100**. After receiving the feedback signal, the processing module **130** transmits an expired signal to the timing module **120** to inform the timing module **120** that the timing module **120** can stop counting the link duration. When the processing module **130** confirms the instruction triggered by the user, the processing module **130** will transmit the instruction to the receiving device **200** using the transceiver module **140**. In an embodiment of the invention, the transceiver module **140** may be the signal sending system of the touch panel **110**, i.e. the instruction can be transmitted according to the touch link technology. In another embodiment of the invention, a reserved response duration is provided to the user to determine whether to trigger the instruction, i.e. the processing module **130** not only indicates the link durations corresponding to the different instructions to the timing module **120**, but also indicates the reserved response duration. When the reserved response duration has expired, the timing module **120** will transmit a message to the processing module **130** to inform the processing module **130** that the reserved response duration has expired. Then, the processing module **130** indicates the link duration corresponding to next instruction to the timing module **120**.

When all link durations corresponding to different instructions have expired, and none of the instructions are triggered, the processing module **130** will indicate the first link duration corresponding to the first instruction to the timing module **120** again (i.e. a new cycle for the link durations will be performed accordingly). In an embodiment of the invention, if none of the instructions are triggered after the number of iterations of the pre-set cycles, the operation will be terminated. For example, if five instructions are pre-set and the number of iterations of the pre-set cycles is set to 3, when none of the instructions are triggered after the link durations corresponding to the five instructions, the processing module **130** performs the next cycle, and when none of the instructions are triggered after all pre-set cycles, the processing module **130** will terminate the operation.

In another embodiment of the invention, the processing module **130** may only indicate the maximum of the link durations to the timing module **120** rather than indicate all link durations corresponding to different instructions to the timing module **120**. When the timing module **120** sets a threshold value as the maximum of the link durations and starts to count the link duration, the timing module **120** will transmit a signal to the processing module **130** to inform the processing module **130** that timing the link duration has started. In an embodiment of the invention, when the threshold value has expired, the timing module **120** will transmit a message to the processing module **130** to inform the processing module **130** that the threshold value has expired. Then the timing module **120** sets its timer to 0 and begins

counting the link duration again after receiving the cycle signal from the processing module **130**. After receiving the feedback signal, the processing module **130** transmits an expired signal to the timing module **120** to inform the timing module **120** that the timing module **120** can stop counting the link duration. The processing module **130** further transmits the inquiry signal to the timing module **120** and confirms the triggered instruction corresponding to the link duration according to the link duration which the timing module **120** responds to. The processing module **130** transmits the instruction to the receiving device **200** through the transceiver module **140** after the processing module **130** confirms the triggered instruction. In an embodiment of the invention, the transceiver module **140** may be the signal sending system of the touch panel **110**, i.e. the instruction can be transmitted according to the touch link technology. In another embodiment of the invention, a reserved response duration is provided to the user to determine whether to trigger the instruction, i.e. the processing module **130** transmits the max link duration plus the reserved response duration to the timing module **120**, and the timing module **120** sets a threshold value as the length of the max link duration plus the reserved response duration and starts to count the link duration.

In an embodiment of the invention, the corresponding relationship of the different instructions and link durations may be stored in a storage module (not shown in the figures) to assist the processing module **130** in confirming the instructions. In another embodiment of the invention, the storage module may also record the instructions that have been triggered between the transmitting device **100** and receiving device **200**. When the touch link between the transmitting device **100** and receiving device **200** is established again, timing module **120** will count the link duration according to the record. In another embodiment of the invention, the timing module **120** counts the link duration corresponding to the instruction which is triggered most frequently according to the record.

In an embodiment of the invention, when the transmitting device **100** transmits the instruction to the receiving device **200**, the processing module **130** may transmit the request for the instruction to the receiving device **200** through the transceiver module **140** first. Only after the receiving device **200** confirms the request for the instruction, the transmitting device **100** transmits the instruction to the receiving device **200**. In another embodiment of the invention, when the receiving device **200** receives the request for the instruction transmitted from the transceiver module **140**, the receiving device **200** will display a window to allow the user to determine whether to receive the request for the instruction, and generate a confirmed result according to the user's determination, and transmit the confirmed result to the transmitting device **100**. Note that the window is only an example of the invention, and the invention should not be limited thereto. The receiving device **200** can also adopt audio, vibration, lights and other methods for the user to determine whether to receive the request for the instruction. When the confirmed result is that the receiving device **200** can receive the instruction, the transceiver module **140** will transmit the instruction to the receiving device **200**. For example, if the triggered instruction is a calling instruction, the transceiver module **140** may transmit the request for the instruction for executing the calling instruction to the receiving device **200** first. Only when the confirmed result is that the receiving device **200** can execute the calling instruction will the transceiver module **140** transmit the calling instruction to the receiving device **200**. If the triggered instruction is a download instruction, the transceiver module **140** may transmit the request for the instruction for executing the download instruction to the receiving device **200** first. Only when the confirmed result is that the receiving device **200** can execute the download instruction, the transceiver module **140** transmits the download instruction to the receiving device **200**. That is to say the transmitting device **100** determines whether to transmit the instruction to the receiving device **200** according to the confirmed result.

In another embodiment of the invention, the transmitting device **100** can transmit the instruction to the receiving device **200** directly rather than transmitting the request for the instruction to confirm. The user can determine whether to transmit the request for the instruction to confirm according his requirements. In an embodiment of the invention, the transmitting device **100** can pre-set an emergency instruction. When the link duration with the receiving device **200** reaches the link duration of the emergency instruction, the transmitting device **100** can transmit the instruction to the receiving device **200** directly rather than transmitting the request for the instruction to the receiving device **200**. For example, the transmitting device **100** may set an emergency instruction to call the police and the link duration of the emergency instruction is 10 seconds. When the link duration with the receiving device **200** reaches 10 seconds, and the emergency instruction is triggered, the transmitting device **100** will transmit the emergency instruction to the receiving device **200** directly rather than transmitting the request for the instruction to the receiving device **200**.

In an embodiment of the invention, the processing module **130** can inform the user for an instruction corresponding to the current link duration through the informing module **150**. The informing module **150** generates the informing signal corresponding to the instruction to inform the user to provide an instruction corresponding to the current link duration, wherein the informing module **150** generates the informing signal through audio, vibration, light or other methods. Note that, the example is only for clarifying the concept of the invention, but the invention should not be limited thereto.

In an embodiment of the invention, when the touch link between the transmitting device **100** and the receiving device **200** has been established according to the touch link technology, the transceiver module **140** may transmit an instructions list to the receiving device **200**. In another embodiment of the invention, the transceiver module **140** may be the signal sending system of the touch panel **110**, i.e. the instructions list can be transmitted according to the touch link technology. The instructions list shows the relationship of link durations and instructions. The receiving device **200** can know the instruction which the transmitting device **100** may transmit given different link durations according to its counting function and so that the receiving device **200** may prepare for the instructions in advance. Therefore, for some time-consuming instructions, the receiving device **200** may prepare for these instructions in advance to improve operational efficiency.

FIG. **6** is a block diagram of a receiving device **200** according to an embodiment of the invention. In an embodiment of the invention, the receiving device **200** comprises a touch panel **210**, a transceiver module **220**, a display module **230**, a processing module **240**, and a touch-link module **260**. Note that, in order to clarify the concept of the invention, FIG. **6** presents a simplified block diagram. However, the invention should not be limited to what is shown in FIG. **6**. The receiving device **200** can further comprise other modules and elements.

In an embodiment of the invention, the receiving device **200** establishes the touch link with transmitting device **100** through the touch panel **210** according to the touch link technology. After the touch link is has been established, the transceiver module **220** may receive the instructions from the transmitting device **100**. In an embodiment of the invention, before the transmitting device **100** transmits the instructions to the receiving device **200**, the transceiver module **220** may receive the request for the instruction from the transmitting device **100** first. The receiving device **200** will transmit the request for the instruction to the processing module **240** after receiving the request for the instruction. The processing module **240** may command the display module **230** to display the request for the instruction on a window or interface to provide the user with an opportunity to determine whether to receive the request for the instruction, generate a confirmed result according to the user's determination, and then transmit the confirmed result to the transmitting device **100** through the transceiver module **220**. Note that the receiving device **200** can also adopt audio, vibration, lights and other methods to inform the user to decide whether to receive the request for the instruction. Only when the confirmed result is that the user has decided to receive the request for the instruction will the transceiver module **220** receive the instruction from the transmitting device **100**. In an embodiment of the invention, the transceiver module **220** may be the signal receiving system of the touch panel **210**, i.e. the request for the instruction and/or the instructions can be received according to the touch link technology.

In an embodiment of the invention, when a touch link between two electronic devices has been established, the two electronic devices can determine which device is the transmitting end (e.g. transmitting device **100**) and which device is the receiving end (e.g. receiving device **200**) using a determination mechanism, such as a button setting (e.g. virtual buttons, physical buttons, or other user interfaces), sensing result (e.g. the direction and relative location of the devices), or audio indications. After the transmitting end and the receiving end are determined, the transmitting end may determine the instruction according to the link duration of the two devices, and then transmit the instruction to the receiving end.

FIG. **7** is a flow chart **700** illustrating the transmission method according to an embodiment of the invention, wherein the transmission method is applied to the transmitting device **100**. First, in step S**710**, the transmitting device **100** establishes a touch link with the receiving device **200** through its touch panel. In step S**720**, the transmitting device **100** determines an instruction according to a link duration of the transmitting device **100** and the receiving device **200** after the touch link has been established. In step S**730**, the transmitting device **100** transmits the instruction to the receiving device **200**.

In an embodiment of the invention, step S**720** further comprises that the transmitting device **100** may start to count the link duration of the touch link and generate a counting result after the touch link has been established. In another embodiment of the invention, step S**720** further comprises that when the transmitting device **100** receives a feedback signal, the transmitting device **100** may stop counting the link duration. In an embodiment of the invention, a reserved response duration can be added between the different link durations.

In an embodiment of the invention, step S**730** further comprises that the transmitting device **100** may transmit a request for the instruction to the receiving device **200**, before transmitting the instruction to the receiving device **200**. Only when the receiving device **200** determines to receive the instruction may the transmitting device **100** transmit the instruction to the receiving device **200**.

In an embodiment of the invention, the flow chart **700** further comprises the step of generating the informing signal according to the instruction to inform the user for the instruction corresponding to the current link duration, wherein the informing signal can be generated through audio, vibration, light or other methods. In another embodiment of the invention, the flow chart **700** further comprises the step of storing each of the link durations corresponding to different instructions. In another embodiment of the invention, the flow chart **700** further comprises the step of transmitting the instruction list to the receiving device **200** after the touch link between the transmitting device **100** and the receiving device **200** has been established.

FIG. **8** is a flow chart **800** illustrating the transmission method according to another embodiment of the invention, wherein the transmission method is applied to the receiving device **200**. In step S**810**, the receiving device **200** establishes the touch link with the transmitting device **100** through its touch panel. In step S**820**, the receiving device **200** receives the instruction from the transmitting device **100**.

In an embodiment of the invention, step S**820** further comprises that the receiving device **200** may receive the request for the instruction from the transmitting device **100** before receiving the instruction. The receiving device **200** may display the request for the instruction on a window or interface to allow the user to determine whether to receive the request for the instruction, after which the receiving device **200** may generate a confirmed result according to the user's determination. Note that the receiving device **200** can also adopt audio, vibration, lights and other methods to alert the user that he may make a determination as to whether or not to receive the request for the instruction. Only when the confirmed result is that the user has chosen to receive the request for the instruction will the receiving device **200** receive the instruction from the transmitting device **100**.

FIG. **9** is a flow chart **900** illustrating the transmission method according to another embodiment of the invention, wherein the transmission method is applied to the transmitting device **100** and the receiving device **200**. First, in step S**910**, the first electrical device and second electrical device establish the touch link through their touch panels. In step S**920**, the first electrical device and second electrical device determine which device is transmitting end and which device is receiving end by a determination mechanism, after the touch link has been established, wherein the transmitting end can be the transmitting device **100** and the receiving end can be the receiving device **200**. In step S**930**, the transmitting end determines the instruction according to the link duration of the first electrical device and second electrical device. In step S**940**, the transmitting end transmits the instruction to the receiving end. In an embodiment of the invention, the determination mechanism comprises the button setting, sensing result, audio indications or other methods.

According to the transmission methods of above embodiments, the different instructions can be triggered according to different link duration of devices, and therefore, it promotes convenience and operational efficiency when the user uses touch link technology to transmit different instructions.

The steps of the method described in connection with the aspects disclosed herein may be embodied directly in hardware, in a software module executed by a processor, or in a

combination of the two. A software module (e.g., including executable instructions and related data) and other data may reside in a data memory such as RAM memory, flash memory, ROM memory, EPROM memory, EEPROM memory, registers, a hard disk, a removable disk, a CD-ROM, or any other form of computer-readable storage medium known in the art. A sample storage medium may be coupled to a machine such as, for example, a computer/processor (which may be referred to herein, for convenience, as a "processor") such that the processor can read information (e.g., code) from and write information to the storage medium. A sample storage medium may be integral to the processor. The processor and the storage medium may reside in an ASIC. The ASIC may reside in user equipment. Alternatively, the processor and the storage medium may reside as discrete components in user equipment. Moreover, in some aspects any suitable computer-program product may comprise a computer-readable medium comprising codes relating to one or more of the aspects of the disclosure. In some aspects a computer program product may comprise packaging materials.

Reference throughout this specification to "one embodiment" or "an embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment is included in at least one embodiment of the invention, but do not denote that they are present in every embodiment. Thus, the appearances of the phrases "in one embodiment" or "in an embodiment" in various places throughout this specification are not necessarily referring to the same embodiment of the invention.

While the invention has been described by way of example and in terms of preferred embodiment, it is to be understood that the invention is not limited thereto. Those who are skilled in this technology can still make various alterations and modifications without departing from the scope and spirit of this invention. Therefore, the scope of the present invention shall be defined and protected by the following claims and their equivalents.

What is claimed is:

1. A transmitting device, comprising:

a touch panel;

a touch link module for establishing a touch link with a receiving device through the touch panel;

a processing module for determining an instruction according to a link duration of the transmitting device and the receiving device after the touch link being established; and

a transceiver module for transmitting the instruction to the receiving device.

2. The transmitting device of claim **1**, wherein the link duration is a time duration of a communication channel established by the transmitting device and the receiving device.

3. The transmitting device of claim **1**, wherein the link duration is a time duration when the transmitting device is in physical proximity to the receiving device.

4. The transmitting device of claim **1**, further comprising:

a timing module for counting the link duration and transmitting a counting result to the processing module after the touch link being established.

5. The transmitting device of claim **4**, wherein the processing module indicates a first link duration corresponding to a first instruction to the timing module, and when the first link duration has expired, indicates a second link duration corresponding to a second instruction to the timing module.

6. The transmitting device of claim **4**, wherein the processing module indicates a first link duration corresponding to a first instruction and a reserved response duration to the timing module, and when the first link duration has expired, indicates a second link duration corresponding to a second instruction and the reserved response duration to the timing module.

7. The transmitting device of claim **4**, wherein the processing module indicates a maximum of the link durations corresponding to each of the instructions to the timing module; or the processing module indicates a maximum of the link durations corresponding to each of the instructions and a reserved response duration to the timing module.

8. The transmitting device of claim **4**, wherein when the processing module receives a feedback signal, the processing module transmits an expired signal to the timing module to stop counting the link duration.

9. The transmitting device of claim **8**, wherein the feedback signal is generated by picking up or moving the transmitting device and the receiving device, knocking at the transmitting device, pressing a specific button on the transmitting device, or controlling the transmitting device by voice control.

10. The transmitting device of claim **4**, wherein the counting result is a message that the link duration has expired, a message that the reserved response duration has expired, or the link duration.

11. The transmitting device of claim **1**, wherein the processing module transmits a request for the instruction to the receiving device through the transceiver module before transmitting the instruction to the receiving device, and the transmitting device determines whether to transmit the instruction to the receiving device according to a confirmed result of the receiving device.

12. The transmitting device of claim **1**, further comprising:

an informing module for generating an informing signal corresponding to the instruction to inform the user for the instruction corresponding to a current link duration.

13. The transmitting device of claim **1**, further comprising:

a storage module for storing a corresponding relationship between the link durations and the instructions.

14. The transmitting device of claim **1**, wherein the transceiver module transmits an instructions list to the receiving device after the touch link has been established.

15. A transmission method, applied to a transmitting device, comprising:

establishing a touch link with a receiving device through a touch panel of the transmitting device;

determining an instruction according to a link duration of the transmitting device and the receiving device after the touch link being established; and

transmitting the instruction to the receiving device.

16. The transmission method of claim **15**, wherein the link duration is a time duration of a communication channel established by the transmitting device and the receiving device.

17. The transmission method of claim **15**, wherein the link duration is a time duration when the transmitting device is in physical proximity to the receiving device.

18. The transmission method of claim **15**, further comprising:

counting the link duration and transmitting a counting result to the processing module after the touch link has been established; and

stopping counting the link duration when receiving a feedback signal.

19. The transmission method of claim 18, wherein the feedback signal is generated by picking up or moving the transmitting device and the receiving device, knocking at the transmitting device, pressing a specific button on the transmitting device, or controlling the transmitting device by voice control.

20. The transmission method of claim 18, wherein the counting result is a message that the link duration has expired, a message that the reserved duration has expired, or the link duration.

21. The transmission method of claim 15, further comprising:

transmitting an request for the instruction to the receiving device before transmitting the instruction to the receiving device; and

determining whether to transmit the instruction to the receiving device according to a confirmed result of the receiving device.

22. The transmission method of claim 15, further comprising:

generating an informing signal corresponding to the instruction to inform the user for the instruction corresponding to a current link duration.

23. The transmission method of claim 15, further comprising:

storing a corresponding relationship between the link durations and the instructions.

24. The transmission method of claim 15, further comprising:

transmitting an instructions list to the receiving device after the touch link has been established.

25. A transmission method, comprising:

establishing a touch link through touch panels of a first electrical device and a second electrical device;

determining which of the first electrical device or the second electrical device is a transmitting end and which is a receiving end using a determination mechanism after the touch link being established;

determining an instruction according to a link duration of the first electrical device and second electrical device; and

transmitting the instruction to the receiving end.

26. The transmission method of claim 25, wherein the determination mechanism comprises a button setting, a sensing result, or an audio indication.

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